

**Novel plant acyltransferases specific for long-chain polyunsaturated fatty acids****Abstract**

The present invention relates to a process for the production of long-chain polyunsaturated fatty acids in an organism by introducing, into the organism, nucleic acids which code for polypeptides with acyl transferase activity. These nucleic acid sequences, if appropriate together with further nucleic acid sequences which code for polypeptides of the fatty acid or lipid metabolism biosynthesis, can advantageously be expressed in the organism. Furthermore, the invention relates to a method for the production of oils and/or triacylglycerides with an elevated content of long-chain polyunsaturated fatty acids.

The invention furthermore relates to the nucleic acid sequences, nucleic acid constructs, vectors and organisms comprising the nucleic acid sequences according to the invention, vectors comprising the nucleic acid sequences and/or the nucleic acid constructs and to transgenic organisms comprising the abovementioned nucleic acid sequences, nucleic acid constructs and/or vectors.

A further part of the invention relates to oils, lipids and/or fatty acids produced by the process according to the invention and to their use.